



International Partnership
on **MPAs, Biodiversity**
and **Climate Change**

Blue Carbon in Marine Protected Areas

CASE STUDY

RENFORC Seagrass Restoration Project, Strait of Bonifacio Nature Reserve, Corsica



April and June 2021 expeditions: Taking of cuttings and transplanting of seagrass beds @G.I.S Posidonie.

The International Partnership on MPAs, Biodiversity and Climate Change is an alliance of government agencies and organisations from across the world, working together to progress the evidence base around the role of Marine Protected Areas (MPAs) and biodiversity in tackling climate change.

Our vision is for global decision-makers to implement MPA networks as nature-based solutions for biodiversity conservation and climate change mitigation, adaptation, and resilience.

For further information about the Partnership please visit www.mpabioclimate.org

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Posidonia oceanica, is a Mediterranean marine flowering plant that plays a major role in carbon fixation and sequestration. It covers more than 2 million hectares and stores 8 times more carbon than forest soils within a unique bio-constructed structure known as ‘the mat.’ The mat is up to 8 meters deep and can sequester up to 3000 tons of CO₂ equivalent per hectare.

In Corsica, *Posidonia* meadows occupy 60% of the seabed between 0m and 40m water depth. *Posidonia* is often referred to as the “lung of the Mediterranean”. However, the meadows are in decline across the Mediterranean due to climate change and human activities, including the anchoring of recreational boats.

RENFORC programme (“Reinforcement of carbon sinks in the marine environment”) is a three-year project that will develop a strategy for reinforcing carbon sinks in the marine environment, with a focus on *Posidonia* seagrass restoration by establishing an experimental demonstration project. The project will pilot *Posidonia* restoration techniques in the Bay of Sant’Amanza, within the Strait of Bonifacio Nature Reserve (MPA), located to the south of the island of Corsica.

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Outcomes from Case Study

The Strait of Bonifacio Nature Reserve is an 80,000 hectare MPA located between the islands of Corsica and Sardinia. Pressures and significant maritime traffic make it both a major trade hub and an important area to protect. Several hectares of *Posidonia* seagrass meadows have been destroyed over the past decades, mainly in the bay of Sant’Amanza. An estimated loss of 8 hectares was observed between 2019 and 2020. New regulatory measures have been implemented, including a ban on recreational anchoring on seagrass beds in the MPA.

MPAs are management tools that limit the development of activities likely to have impacts on the marine environment, particularly on some habitat or species of interest and/or protected. They eliminate or reduce anthropic pressures to allow the resilience of the environment and protect marine biodiversity. When the environment is already permanently degraded, active restoration measures can be implemented through some projects, like the project **RenforC**.

The main objective of the project is to restore the *Posidonia* seagrass meadow. It represents a significant challenge, especially considering the extent of its coverage and its carbon sequestration capacity, particularly in the context of climate change.

The project is divided in two times, running from spring 2021 to autumn 2023.

Four techniques for transplanting *Posidonia* seagrass are being tested to evaluate the most effective one(s) at the end of the project. All techniques are being tested in areas consisting of dead mats resulting from the degradation of the seagrass meadow due to anchoring. Each technique is being carried out by pre-identified scientific teams based on their expertise in the field of restoration.

The identified scientific teams are :

- THALASSA Marine Research & Environmental Awareness (France)
- University of Palermo - Bio-survey (Italy)
- University of the Balearic Islands - IMEDEA (Spain)
- International School for Scientific Diving (ISSD) “Anna Proietti Zolla” (Italy).

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Phase 1 involved a seminar in spring 2021 on strategies for strengthening carbon sinks in the marine environment and the restoration of *Posidonia* seagrass. During this phase, various strategies and techniques were presented and discussed.

Phase 2 was the longest phase, during which the project teams conducted experiments. Initially, researchers carried out transplantations based on a reference state and implemented different techniques (such as photogrammetry, bundle counts, and evaluation of the vitality of existing *Posidonia*). The project teams monitored and observed the transplants and natural recolonization annually for 2 years (spring/summer of 2022 and 2023) to track progress.

Future Desired Outcomes

The project will be engaging with stakeholders and developing a communication strategy. These activities will increase awareness of the degradation of *Posidonia* meadows and the causes, communicate the benefits *Posidonia* meadows provide, share the results of the restoration activities and present the long-term restoration strategy.

How do these outcomes address climate change adaptation strategies, climate change mitigation, and conserving biodiversity?

The project aims to develop and validate a strategy for strengthening carbon sinks in the marine environment. To achieve this, different strategies (conservation and natural recolonization) and restoration methods have been tested.

The project therefore aims to restore the sequestration capacity of *Posidonia* habitats, which is well suited to climate change mitigation strategies. Restoring seagrass habitats can also be seen as a climate change adaptation strategy, since seagrass beds are nature-based solutions that help protect coastlines by attenuating the effect of swell and wave energy. This project has a real potential for conserving biodiversity, mitigating the effects of climate change and adapting to it all at the same time.

How is this case study and lessons learned transferable to other MPAs globally?

The ecological and financial costs of these approaches have been evaluated to efficiently restore the ecosystem services provided by seagrass meadows. The pilot site will provide valuable insights that can be extrapolated to the entire French Mediterranean coastline. The international partnership MPABCC could be a way to share the results and promote them and share successful projects offering innovative techniques.

Next Steps/Future Actions Related to the Case Study

In autumn 2023, a feedback seminar will present an assessment of the actions undertaken and enable a long-term strategy to be defined. Observations will have enabled us to select the most effective protocols for replicating the project at other pilot sites.



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References

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